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A Preliminary Study of the Subspecies of the
Jumping Viper, *Bothrops nummifer*

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A Preliminary Study of the Subspecies of the Jumping Viper, *Bothrops nummifer**

W. Leslie Burger

Since 1943 three species in the *nummifer* group of the genus *Bothrops* have been recognized in Mexico and Central America: *nummifer* (Rüppell), *mexicanus* (Duméril, Bibron, and Duméril), and *picadoi* (Dunn). Recent investigations indicate that the first two forms intergrade and therefore should be considered subspecies and that the name *nummifer* should be reallocated to the population now known as *mexicanus*. This leaves the subspecies of jumping viper of the southeastern edge of the Mexican plateau without a name.

I am indebted to many persons who have loaned specimens and data, but who cannot be mentioned individually at this time. For frequent encouragement and assistance I owe a special note of thanks to Dr. Hobart M. Smith and Dr. Howard K. Gloyd.

The confusion in the application of the name *nummifer* has stemmed principally from failure to refer to the specimen used by Rüppell (1845) in his original description. Since Rüppell's description is inadequate and the locality is unknown, allocation of the name must be based solely on the holotype. If the characters of this specimen are considered in relation to the diagnostic characters of the two subspecies, the conclusion that the holotype of *nummifer* is a specimen of the southern subspecies is clearly indicated (Table I). In regard to the number of nasorostrals, the relation of the nasals and rostral, and the presence of the lower preocular, the holotype of *nummifer* is a typical example of the southern subspecies. In the number of lateral spots fused to the dorsal spots, in the number of caudals, and in the number of lower temporals included in the postocular stripe, this specimen is within the range of variation of the southern subspecies but tending definitely toward the northern. Specimens showing these or similar features are not infrequent in

*Contribution from the University of Illinois Museum of Natural History, Urbana.

southern Mexico, Guatemala, and British Honduras.

In 1854 Duméril, Bibron, and Duméril, apparently overlooking the earlier name, described a specimen from Cobán, Guatemala, as *Atrops mexicanus*. Their name is definitely a synonym of *nummifer* as shown by the description and figure of the holotype which according to the stated number of ventrals and caudals was probably a female.

Table I. Comparison of the Holotype of *B. nummifer* with the Northern and the Southern Subspecies.

Character	Northern	Southern	Holotype of <i>nummifer</i>
Number of lateral spots fused to dorsal spots	0-4	8-19	8
Number of lower temporals included in postocular stripe	2-4	0-3	3
Number of nasorostrals	0-2	2-3	3
Relationship of nasals and rostrals	in contact	separate	separate
Lower preocular	present	absent	absent
Number of caudals*	23-31	29-39	32

*Data for females only.

Bocourt (1868) evidently had seen the type of *nummifer* when he described *Bothrops affinis* for he accurately contrasts his specimens, which were from San Agustín, Guatemala, with it. Bocourt's name is based on two specimens in which the nasals contacted the rostral. This condition occurs almost invariably in the northern subspecies of *B. nummifer* and in *B. picadoi*, but is also a frequent variation in *nummifer* toward the northern part of its range. The locality given by Bocourt (1868), San Agustín, Guatemala, and his description of the coloration of the cotypes definitely eliminate the northern subspecies of *B. nummifer*. Detailed data on the cotypes are on hand, but in the absence of topotypic specimens allocation of the name *affinis* cannot be determined with certainty without actual examination of the type specimens.+ However, geographic considerations definitely rule out the northern subspecies of *B. nummifer*.

Fischer (1880) apparently realized that he was dealing with the form already described by Duméril, Bibron, and Duméril as *mexicanus* (1854), but since he considered it a variety of *nummifer* rather than a separate species he described it under' the new name *B. nummifer* var. *notata*.

+Data on the cotypes of *affinis* were generously sent to the author by Dr. F. Angel

Cope (1861) is the first author who listed localities within the range of the northern subspecies; however, he did not differentiate it from the southern subspecies. In most of his publications Cope used both *mexicanus* and *affinis* for different species, but he expressed doubt concerning the validity of the latter (Cope, 1871). Gunther (1895) synonymized the three later names with *nummifer* but continued to overlook the northern subspecies, though he also listed specimens from northern localities. Smith (1943) first accurately differentiated the northern subspecies from the southern. He considered them as species, although the possibility that intergradation might be discovered was not overlooked. To the northern form Smith applied the name *B. nummifer* (Rüppell); for the southern he used the next available name, *B. mexicanus* (Duméril, Bibron, and Duméril). As already shown, however, the name *nummifer* actually should be used for the southern subspecies, leaving the northern one without a valid name.

The overlap in variation of typical *nummifer* (formerly called *mexicanus*) and the northern subspecies (formerly called *nummifer*) will be referred to on

Table II. Comparison of the Two Intergrading Specimens with the Northern and the Southern Subspecies of *Bothrops nummifer*.

Character	<i>B. n. nummifer</i>	Average of Two Intergrades	<i>B. n. veraecrucis</i>
Number of lateral spots fused to dorsal spots	8-19	6	0-4
Number of lower temporals included in postocular stripe	0-3	2-3	2-4
Number of nasorostrals	2-3	2	C-2
Relationship of nasals and rostrals	separate	in contact	in contact
Lower preocular	absent	present in one, absent in the other	present

the following pages. In addition, actual intergradation occurs between the two forms as evidenced by two recently collected specimens from San Lucas Camotlan, northeastern Oaxaca, Mexico. These and a specimen of *nummifer* from near Niltepec, Oaxaca, about 75 miles southeast of the source of the intergrades, bridge fairly well the geographic gap between the locality records of the two forms available to Smith (1943) when they were first separated. What is more important, the two specimens from San Lucas Camotlan (USNM 123709 and 123712) also bridge the morphological gap between the two subspecies (Table II). In general appearance both of the specimens are

intermediate; however, the larger one is closer in coloration to the northern subspecies, and the coloration of the smaller one resembles that of northern specimens of *nummifer*. For convenience the locality for the intergrading specimens is given under the new northern subspecies.

In the following accounts of the two subspecies of *Bothrops nummifer* the kind of "skeleton" synonymy used by Gloyd (1940) is adopted. References are limited to (1) the original description, (2) synonyms, (3) general works in common use, and (4) recent publications in which the species or subspecies has received the most complete treatment.

Bothrops nummifer nummifer (Rüppell)

Central American Jumping Viper

Plate I, Figure 1

Atrops nummifer Rüppell, Verz. Senck. Mus., pt. 3, 1845, p. 313* (type locality "unknown," hereby restricted to Teapa, Tabasco, Mexico; type specimen in Senckenberg Museum).

Bothrops nummifera, Amaral, Mem. Inst. Butantan, vol. 4, 1929, p. 239 (part).

Trimeresurus nummifer nummifer, Dunn, Proc. Biol. Soc. Washington, vol. 52, 1939, p. 165 (part).—Smith, Zoologica, vol. 26, pt. 1, 1941, p. 62 (part).

Atropos mexicanus Duméril, Bibron, and Duméril, Erpet. Gen., vol. 7, pt. 2, 1854, p. 1521-2, pl. 83, fig. 6, text fig. 1-3 (type locality Cobán, Guatemala).—Smith, Proc. U. S. Nat. Mus., vol. 93, no. 3169, 1943, p. 398-400.

Lachesis mutus (nec Seba), Gray, Cat. Snakes Brit. Mus., 1854, p. 13 (part).

Bothriechis nummifera var. *notata* Fischer, Archiv. f. Nat., 46th year, vol. 1, 1880, p. 222 (Type locality Cobán, Guatemala).

Holotype. Senckenberg Museum No. 21196, formerly No. 9944, 1a, originally without data but with "Mexico" written in sometime subsequently. In a letter to the author (February 16, 1949) Dr. Robert Mertens wrote:

"Originally the type specimen of *nummifer* had no statement of locality; I suppose that it was my predecessor, Oskar Boettger, who at a later date added 'Mexico'."

In his catalog of specimens in the Senckenberg Museum, Boettger (1898) lists a specimen of *Laemantus serratus* collected by Rüppell in "Mexico." Since *serratus* is an east coast form and since the specimen of it and that of *nummifer* seem to be the only ones collected by Rüppell in Mexico, there is a good possibility that both specimens are from the east coast. These indications and the character of the holotype of *nummifer* point to southeastern Mexico as the source of this specimen. In this region *B. nummifer nummifer* is known at present only from Teapa, state of Tabasco, Mexico, so this locality is hereby designated as the type locality of the form.

*Original page number; the page number 21 in the reprint, in which the pagination was changed, is usually quoted.

Diagnosis. The southern subspecies of *B. nummifer* is distinguished by (1) a characteristic dorsal color pattern with narrow angular dorsal spots, usually three or less scales long at midbody, and corresponding dark lateral spots, a scale or slightly more long, of which eight or more are fused to the dorsal bands; (2) the position and extent of the postocular stripe which in this form either misses the lower row of temporals entirely or includes at the most the upper portions of the last two of this series and seldom extends ventrad to the corner of the mouth; (3) the presence of three, or less frequently two, nasorostral scales which usually separate the nasals from the rostral; and (4) the absence of a lower preocular.

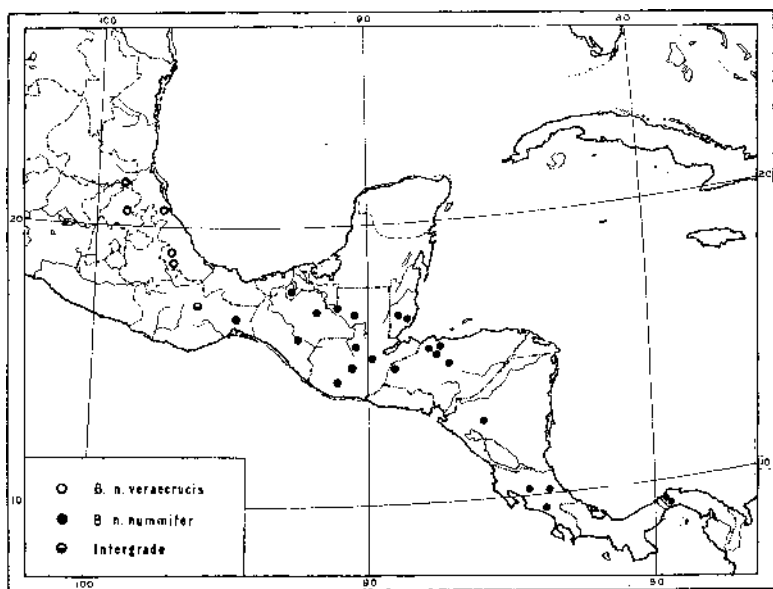


Figure 1. Distribution of the subspecies of *B. nummifer*.

Description of holotype.* Juvenile female with 25 dorsal spots and two corresponding series of lateral spots, of which seven on the left and eight on the right are fused to the dorsal bars; dorsal bars partly confluent in a zig-zag band; postocular stripe including three scales of the lower temporal series; nasorostrals three on each side separating the nasals from the rostral; dorsal scale rows 23-21-19; lower preocular absent; supralabials 9; infralabials 11 on

*Based on information sent to the author by Dr. Robert Mertens who personally examined this specimen.

the right, 12 on the left; supraoculars entire; intersupraoculars 8; ventrals 134; caudals entire, 22 in number; snout-vent length 265 mm.; tail length 33 mm. or 12.5 per cent of the snout-vent length.

Distribution. Hilly terrain from southern Mexico through Central America to Panama (Fig. 1).

LOCALITY RECORDS*

BRITISH HONDURAS: Cariblanca, Dunn (1939); Cohune Ridge, UMMZ 80724; Valentin, UMMZ 80723. **PROV. TOLEDO:** Double Falls+, CNHM 49357; Esperanza, UMMZ 80722.

COSTA RICA: Monte Redondo, Boulenger (1896); Guapiles, Dunn (1939). **PROV. CARTAGE:** Chitaria, Dunn (1939); Peralta, Dunn (1939). **PROV. COMARCA DE LIMON:** Siquirres, Dunn (1939). **PROV. SAN JOSE:** El General, Dunn (1939).

GUATEMALA: USNM 6747. **DEPT. ALTA VERAPAZ:** Boulenger (1896); Chichen, UMMZ 91085; Cobán, Duméril, Bibron, and Duméril (1854); Las Primavera, UMMZ 91086-7; Los Alpes, UMMZ 91082-3. **DEPT. PETEN:** La Libertad USNM 25133; Piedras Negras, USNM 110426-8; Yalpemech, CNHM 40884.

HONDURAS: Lancetillo Hills, Dunn and Emlen (1932); Pueblo Nuevo, MCZ 27223-5; Timba, MCZ 27546. **DEPT. CORTEZ:** Cofradia, CNHM 27125, MCZ 27226-50. **DEPT. SANTA BARBARA:** Chamelicon, MCZ 27251; San Pedro Sula, AMNH 46962-7, EHT-HMS 26663; Trinidad (hills near), March (1929). **DEPT. YORO:** Portillo Grande, CNHM 33888-91, 34758, 35497, 35517-8, 35560-4, 35762-8, 35771-84, 35821-6, 35863-5, 37221; Tela, USNM 84572, 85104-5, 85122-7.

MEXICO. CHIAPAS: El Real, AMNH 66967; Santa Rosa, USNM 110429. **OAXACA:** Niltepec (north of, between Cerro Atravesado and Sierra Madre), AMNH 68879. **TABASCO:** Teapa, Boulenger (1896).

NICARAGUA: Hacienda Rosa de Jericho, 3250 feet, Boulenger (1896); Metagalpa, Boulenger (1896); Tuli, Dunn (1939).

PANAMA. COLON: Pequeni-Esperanza ridge near the head of the Rio Pequeni, 1400 feet, Dunn and Bailey (1939). **PANAMA:** Rio Indio (headwaters of), 3000 feet, ANSP 24682.

*The following lists of locality records constitute also lists of specimens studied. The abbreviations for the museums from which specimens are listed are as follows: Academy of Natural Sciences of Philadelphia, ANSP ; American Museum of Natural History, AMNH Chicago Natural History Museum, CNHM; Edward H. Taylor-Hobart M. Smith Collection, EHT-HMS; Museum of Comparative Zoology, MCZ ; University of Michigan Museum of Zoology, UMMZ; United States National Museum, USNM

+The whereabouts of this locality as indicated on page 163 of *Living Treasure* by Sanderson (1941), who collected the specimen of *nummifer* cited above from Double Falls, seems to be in the mountains approximately 40 miles south of Belize.

1According to Griscom (1932) Sakluk, from which USNM 25133 is recorded, is an old name for La Libertad.

Bothrops nummifer veraecrucis new subspecies
Veracruz Jumping Viper

Plate I, Figure 2

B. [Bothriechis] nummifer (nec Rüppell), Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 12, 1860, p. 345 (part).—*Bothrops nummifer* (nec Rüppell), Smith, Proc. U. S. Nat. Mus., vol. 93, no. 3169, 1943, p. 401 (part).—*Trimeresurus nummifer nummifer* (nec Rüppell), Dunn, Proc. Biol. Soc. Washington, vol. 52, 1939, p. 165 (part).—Smith, Zoologica, vol. 26, pt. 1, 1941, p. 62 (part).

Bothriechis mexicanus (nec Duméril, Bibron, and Duméril), Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 13, 1861, p. 294-5 (part).

Bothriopsis affinis (nec Bocourt), Cope, Proc. Acad. Nat. Sci. Philadelphia, vol. 23, 1871, p. 208-9 (part).

Holotype. U. S. National Museum No. 25045, collected by C. Sartorius in the state of Veracruz, Mexico. This specimen is probably from Mirador since Sartorius collected other specimens of this species at that locality. For this reason Mirador, state of Veracruz, Mexico, is designated as the type locality.

Diagnosis. The northern subspecies is distinguished from the southern by (1) a dorsal color pattern with broad rounded spots, usually five scales long, or slightly less, at midbody, and corresponding rows of lateral spots, usually about two scales wide, of which fewer than eight are fused to the dorsal spots; (2) the position and extent of the postocular stripe which in this form covers all of the last temporal of the lower series, most of the penultimate, and usually the upper portions of additional scales of this series, and extends across the mouth and two or more scales beyond; (3) by the broad contact of the nasals with the rostral, with less than three and frequently with no nasorostral scales; and (4) the presence of a small lower preocular.

Description of holotype. Gravid female with 23 dorsal spots and two corresponding lateral series of spots of which only the next to the last on the right and the second from the last on the left are fused to the dorsal spots; dorsal spots largely confluent; postocular stripe including four scales of the lower temporal series on the right and five on the left; no nasorostrals; nasals and rostral in broad contact; dorsal scale rows

	8	11	16	53	72	87	103	123	135
	6+7	6+7	6	7	6+7	5+6	5+6	5	
31	—	29	—	27	—	25	23	21	19
	6+7	6+7	6+7	7	6+7	5+6	6	6	
	8	11	15	37	70	90	101	127	135

lower preocular present; supralabials eight on the right, nine on the left; infralabials 11; supraoculars entire; intersupraoculars 8; four scales in a median line from a line connecting the anterior border of the supraoculars to the in-

ternasals; ventrals 135; caudals entire, 23 in number; snout-vent length 471 mm.; tail length 45 mm. or 14.7 per cent of the snout-vent length.

Distribution. Southeastern edge of Mexican Plateau from Xilitla, state of San Luis Potosi, Mexico, south into Oaxaca (Fig. 1).

LOCALITY RECORDS

HIDALGO: Zacualtipan, ANSP 14768. OAXACA: 4 miles south of San Lucas Camotlan, USNM 123709, 123712 (intergrades with *B. n. nummifer*). PUEBLA: Necaxa, UMMZ 63942. SAN LUIS POTOSI: Xilitla, Taylor (1949). VERACRUZ: USNM 25044: Cordoba, Dugès (1896); Huatusco, Boulenger (1896); Mirador, USNM 6371; Tux-pan, Cope (1871)

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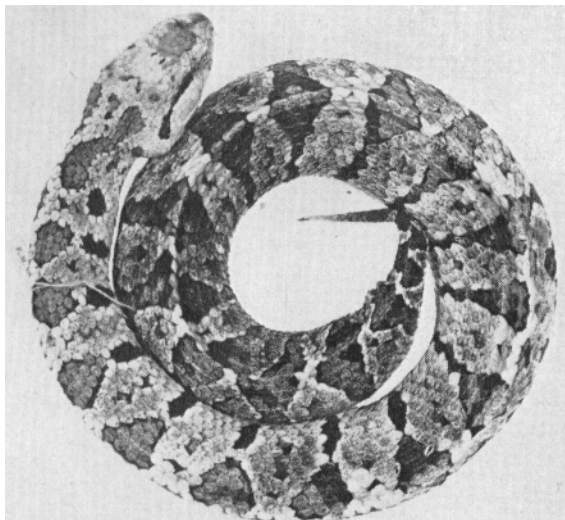


Figure 1. *Bothrops nummifer nummifer*
Yoro, Honduras.

USNM 123712, Portillo Grande,

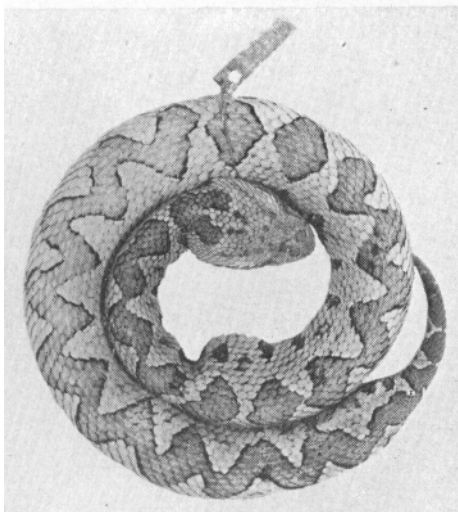


Figure 2. *Bothrops nummifer veraecrucis* new subspecies; USNM 25045 (holotype),
Veracruz, Mexico.